[illegible]
ASSISTANT ATTORNEY GENERAL
DIRECTOR

STEVEN A. [illegible]
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PLAN FOR THE CLEANUP OF BERRYS CREEK SUBMITTED BY THE PLAINTIFF, STATE OF NEW JERSEY, DEPARTMENT OF ENVIRONMENTAL PROTECTION

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823960002

INTRODUCTION

The following report is submitted pursuant to this Court's mandate to develop a plan for the cleanup of Berrys Creek and provide a timetable and cost estimate for its implementation. Same sets forth plaintiff's conceptual proposals for the cleanup in question. The implementation of this project requires the retention of an engineering firm to prepare the necessary plans and specifications; apply for and obtain the appropriate governmental permits; retain the services of persons necessary to carryout the field work required, and supervise the actual cleanup operations.

I

The Sediments In Berrys Creek Should Be Dredged

The sediments in Berrys Creek exhibit substantial mercury contamination from the railroad bridge which constitutes the northern boundary of the Velsicol property downstream to the Route 3 bridge (approximately 12,000 feet). It is therefore recommended that the creek be dredged between these two points in order to reduce the amount of mercury available for continuous release into the environment and uptake by living organisms. It is estimated, based on the physical dimensions of Berrys Creek along this stretch and the technical requirements of dredging, that approximately 175,000 cubic yards of bottom sediments will have to be removed. These contaminated sediments should be removed by use of a cutter head suction dredge and pumped to a secure dewatering/disposal facility.

The dredging, dewatering and disposal operations must be designed and implemented so as to minimize the release of mercury into the air and waters of the State. An engineering firm/general contractor shall be retained, at defendants expense, to prepare a predesign study and a preliminary design report necessary to implement the aforementioned operation. [redacted]

without dredging ?
during " ?
AFTER " ?

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[redacted] While the State of New Jersey, Department of Environmental Protection (Department) believes that the health hazards associated with this project will be minimal the plans should nonetheless contain an assessment, by a duly qualified medical expert, of the effects of the dredging and dewatering operation on the workers and others who may be exposed to the mercury and mercury compounds involved.

The aforementioned detailed plans and specifications shall be submitted to this Court and to the Department for approval prior to the commencement of any dredging in Berrys Creek.

It is important to note that the marshes adjacent to the portions of Berrys Creek to be dredged are also severely contaminated as a result of defendants' past activities; however, the Department does not presently have sufficient information to recommend a final solution to this problem. Therefore the Department proposes that as part of the cleanup plan a fund be created to pay for laboratory and field studies necessary to determine whether in the future the marshes will continue to act as a source of mercury pollution to the environment. If so, said fund shall have sufficient moneys in it to devise and implement a mechanism to minimize and/or abate any adverse environmental impact resulting from this continued contamination. In any event, after dredging, the banks of Berrys Creek should be stabilized to prevent the reentry of contaminated material into it.

II

The Disposal of the Contaminated Sediments Dredged From Berrys Creek

It is the Department's recommendation that unless the mercury and other pollutants in the sediments taken from Berrys Creek can be safely recovered during and/or after dredging, the dredged spoils must be disposed of by placing them in a secure dewatering/disposal site. Such a site would allow for the safe draining of excess water dredged from the creek and, further, provide an area where the contaminants can be permanently isolated from the environment. Preferably this facility should be in close proximity to the properties which are the subject of this litigation. It is respectfully submitted that this approach will provide maximum protection to the environment at minimum costs.

The dewatering/disposal facility discussed above shall include, at a minimum, the following features:*

1. A bottom liner consisting of two feet of clay compacted to a maximum permeability of 1×10^{-7} centimeter per second (cm/sec). If there is sufficient clay underlying the disposal area, a cutoff wall/slurry trench, of equal maximum permeability, can be utilized in lieu of the bottom liner.

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* Specifications for the dewatering/disposal facility are also discussed in the cost estimate portion of this memorandum, pp. 13-16, *supra*.

2. Diking of sufficient height to contain the dredged spoil material.

3. The bottom liner shall be extended up the interior slope of the aforementioned dikes.

4. A top liner consisting of two feet of clay, once again compacted to a maximum permeability of 1×10^{-7} cm/sec shall be placed over the dewatered dredged spoils. Additionally, one foot of top soil properly graded and seeded shall be placed over the clay top liner.

The above described containment system, minus the top liner, shall be used as the dewatering facility for the contaminated dredged spoils taken from Berrys Creek. As the dredged spoils are pumped into the dewatering facility, powdered sulfur or some other chemical compound, approved beforehand by the Department, shall be added in order to minimize the release of mercury during this process. Effluent discharged during the dewatering operation shall meet all state and federal standards and/or criteria.

The dewatering/disposal site selected should be within the effective pumping range of the dredge (approximately one mile without booster pump), to eliminate transportation costs.* Sites available in and about Berrys Creek which meet

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* Each booster pump is capable of pumping the dredged spoils an additional mile at a cost of approximately $100,000 for each booster pump used.

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this criteria are limited. Initially they must be large enough to accept a minimum of 175,000 cubic yards of sediment, i.e. approximately 15 acres. Sites of this size would involve substantial acquisition costs. Additionally, much of the land in and about Berrys Creek which would be large enough to be used as a secured landfill for the purpose of containing the contaminated dredged spoils is marshland, i.e. wetlands. In order to fill these areas, a permit from the U.S. Army Corps of Engineers involving comments from the U.S. Fish and Wildlife Service, is necessary. These agencies have already informally advised the Department that they will oppose any filling of wetlands unless all other alternatives are rejected as not being feasible or prudent. Furthermore, much of the wetland areas in the Hackensack Meadowlands District are zoned for preservation which precludes them from being used as landfill sites. Upland areas which could be used are even more limited. There are few upland areas close enough and large enough to handle an operation of this type. Furthermore, the use of most marshland and upland sites in the area would create the necessity of dealing with two permanent hotspots of mercury instead of one.

In light of the above, the Department has concluded that the most practical and cost effective solution to the disposal of Berrys Creek dredged spoils is the use of the Velsicol tract as a dewatering and disposal facility. The site is already highly contaminated and the placement of additional contaminated sediments on top of it would concentrate the area of contamination to one rather than two or more sites. Expensive land acquisition costs would be avoided. Because most of the property is landfill and not wetlands there would be minimum objections from federal and state regulatory agencies. Additionally, by entombing the dredged spoils on the Velsicol property, problems associated with the mercury already there would be solved at the same time.

Finally, the costs associated with using the Velsicol property, as is more particularly discussed in Section IV supra at pp. 13-16, would be comparable to those associated with using another site.

Permanent structures should not be built on top of secure hazardous waste landfills such as would be constructed to contain the dredged spoils from Berrys Creek. The purpose of a secure landfill is to permanently seal off and isolate from the environment the hazardous material contained therein. Construction on top of such a facility would threaten the integrity of the entombment system. Additionally, because of the high degree of mercury contamination that would exist within the entombed area, building enclosed structures on it could pose a serious health hazard. In the future as the structures settle and crack, vapors from beneath the ground would escape into it and the mercury concentrations inside this closed environment could reach dangerous levels. It is therefore the Department's position that because of the environmental and health risks involved, the dewatering/disposal facility constructed to contain the dredged material should not be developed absent a clear and convincing showing by the person seeking to do so that the development proposed can be done without affecting the integrity of the entombment system and without the release of contaminants into the environment.

Irrespective of how the secure landfill created is used it is imperative that stringent safeguards be imposed to insure its integrity. Furthermore, systems must be created to guarantee that it does not ever constitute a threat to the environment and/or persons who might work or live on or about the site. This would include, but is not limited to, continuous health monitoring of all employees and residents who work and/or live on or near the site; continuous monitoring of the entombment system to insure its integrity and provisions for continuous maintenance of the containment structure. Finally, monitoring of the air, water and biota in and about it should be conducted indefinitely into the future until the need no longer exists. The same is true for the affected portions of the Berrys Creek ecosystem.

It should be noted that in addressing the dredged spoil disposal problem, the Department also considered the options of ocean disposal, resource recovery and offsite treatment. With regard to ocean disposal, it was concluded that federal and state approvals necessary to engage in this type of activity would not be forthcoming. Resource recovery, while the preferred alternative since the mercury would be permanently removed from the Berrys Creek ecosystem, was discounted because of the costs involved. Similarly, transport of the contaminated sediments out of the Berrys Creek basin to secure disposal sites elsewhere was determined not to be economically feasible because of the transportation costs involved.

For the reasons set forth above it is recommended that the Velsicol property be utilized as the dewatering/disposal facility for the dredged spoils taken from Berrys Creek and, further, that development of this site be restricted accordingly.

III

TIMETABLE

The cleanup of Berrys Creek will involve several stages which will take years to complete. This does not include time that will be consumed by appeals.

Initially this Court must approve the Department's dredging plan and designate a dredged spoil disposal site. Thereafter formulation of a detailed engineering plan for dredging, dewatering and disposal of the contaminated sediments is required in order to begin the process of securing all necessary permits that will allow the cleanup of Berrys Creek to commence. Once this process is completed actual construction can begin; however, this will have to be done in stages, i.e. construction of the dewatering and treatment facility; dredging; dewatering; final entombment, etc.

For any cleanup plan ultimately chosen, there will be a number of state and federal regulatory requirements which must be satisfied and, further, several permits which must be obtained. Because the cleanup of Berrys Creek will entail the movement of a significant quantity of hazardous material, there will be a need to obtain review and permits from several federal and state agencies which have not heretofore been involved in this case.

At the federal level, permits will be required from the United States Army Corps of Engineers. The Corps permitting authority comes under §10 of the Rivers and Harbors Act of 1899 (33 U.S.C.A. §403) and §404 of the Federal Water Pollution Control Act Amendments of 1972 (33 U.S.C.A. §1344). The §10 permit regulates the excavation of dredged material in the waters of the United States while §404 permit involves jurisdiction over the discharge of dredged or fill materials in the waters of the United States. One permit application will suffice to meet the requirements of both statutes. Processing time by the Corps for a permit of the type involved here can vary from four to twenty-four months.

In addition to the federal permit, there are several state permits which are required. The dredging of the bed of Berrys Creek will involve riparian lands and thus necessitate a waterfront development permit and a commercial dredging license (N.J.S.A. 12:5-1 et seq.). The application for a permit and license of this type must be approved by the State's Natural Resource Council, the Commissioner of the Department, the Attorney General and the Governor. The time necessary to secure the appropriate riparian approvals and instruments would be six to nine months; however, same could be applied for concurrently with the federal permits. Furthermore, a stream encroachment permit will be necessary for the dredging and possibly for the disposal site (N.J.S.A. 58:1-26). Permits must also be obtained from Hackensack Meadowlands Development Commission (N.J.S.A. 13:17-1 et seq.). It is expected, barring any unforseen difficulties, that these latter permits can be obtained within 90 days of an appropriate application being filed.

Additionally, the dredged material disposal site will need to be registered as a solid waste facility under the Solid Waste Management Act (N.J.S.A. 13:1E-1 et seq.). The Solid Waste Administration within the Department will require the submission of an engineering design plan and environmental report for their review and approval. This registration process, which generally takes between four to six months, also requires the Department to hold a public hearing on the proposed plan.

Furthermore, any plan which will entail the construction of a secured landfill as a disposal site must be in conformance with the master plan and zoning regulations of the Hackensack Meadowlands Development Commission as long as the land falls within the jurisdiction of that regulatory body. In the case of the Velsicol tract, a portion is in the Hackensack Meadowlands Development District.

Finally, even after all necessary approvals and permits are obtained actual implementation of the dredging process, construction of the dewatering/disposal facility, dewatering and final closure can be expected to take approximately 1 1/2 years. Predredging construction of the dewatering facility will take from three to five months. Dredging itself can be expected to take approximately 90 days, while the dewatering process will take between six and eight months. Thereafter final construction can be expected to take an additional 2 1/2 months.

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Cost Estimates for Dredging Berrys Creek and Disposing of Contaminated Dredged Spoils

It is estimated that the dredging of Berrys Creek between the Route 3 bridge and the northern boundary of the Velsicol parcel will cost between $875,000 and $975,000, depending on whether or not a booster pump is required to pump the dredged spoils to the dewatering/disposal facility.

It is estimated that a 15-acre site* will be needed to dispose of the 175,000 cubic yards of contaminated dredged spoils that will be removed from Berrys Creek. The disposal area will have to have constructed on it 3,306 linear feet of diking (a rectangle 1000' x 653'). The dike will have to be 10.5' in height, have a top width of 10' and have 2:1 side slopes. It is estimated that the cost of constructing a dike of this type will be $460,000.

Additionally, a bottom liner consisting of a minimum of two feet of clay compacted to a maximum permeability of 1×10^{-7} cm/sec

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* Acquisition costs for a dispoal site have not been included in this estimate because of the variability of land values in the area. Until such time as a disposal site is selected and approved it is speculative to estimate what the cost of acquisition will be.

will be required. Same will cost approximately $500,000.

A top liner consisting of a minimum of two feet of clay ($500,000), one foot of topsoil ($120,000) and seeding ($15,000) for a total cost of $635,000 will also be necessary.

A leachate collection system at a cost of approximately $38,000 will also be required.

If the dewatering/disposal facility is constructed on marshland/wetlands, at least five feet of soil* will have to be placed under the bottom liner to prevent settlement and to separate the dewatering/disposal area from local groundwater. It is estimated that this will cost an additional $600,000.

Finally, engineering fees required to design and construct the aforementioned facility are estimated at $470,000 (approximately 15% of the project cost).

Thus, the cost of designing and constructing a dewatering/disposal facility for the dredged spoils taken from Berrys Creek, exclusive of land acquisition expenses, is estimated to be between $2,900,000 and $3,600,000, depending on whether or not the facility is built on marshland or upland.

Costs involved in using the Velsicol property as the dewatering/disposal site are as follows:

Dredging costs would be the same, i.e. $875,000.

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* The thickness of clean soil will be based on compaction and other field tests to be conducted prior to the commencement of construction.

In lieu of a bottom liner discussed above a cutoff wall to the underlying clay would be constructed around the perimeter of the 19-acre upland portion of the Velsicol tract. The cutoff wall would be approximately 4,500 linear feet* and constructed with bentonite slurry at least two feet wide to a depth of 20 feet.** The cutoff wall would cost approximately $630,000.

The top liner on the Velsicol tract would include two feet of clay ($640,000), one foot of topsoil ($125,000) and seeding ($15,000) for a total cost of $780,000.

The dike required for the Velsicol property would have to be 14 feet in height, 10 feet across at the top and have a 2:1 side slope. It would cost $892,000.

Engineering costs for designing and constructing a dewatering/disposal facility on the Velsicol parcel would be approximately $480,000 (15% of total project cost).

Thus the total costs associated with using the Velsicol site would be approximately $3,700,000.

It is important to note that the aforementioned figures

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* The cutoff wall would extend around the Wolf property. This involves an additional 500 linear feet of wall which will only cost an extra $70,000. Given the enormous amount of mercury still on the Wolf property it is well worth including this area in whatever containment system is constructed in and about the Velsicol property.

** Soil borings to determine the exact depth of the clay layer underlying the Velsicol parcel are needed to accurately determine how deep the cutoff wall must be.

are merely estimates based on best available information and the Department's experience in reviewing costs associated with similar projects. Until such time as an engineering firm is retained to draw up final plans and specifications and the matter is put out to bid, it will be impossible to provide a more exact cost estimate.

Hackensack Meadowlands Development Commission
100 MEADOWLANDS PARKWAY • SECAUCUS, NEW JERSEY 07094
Telephone (201) 864-1290 N.J. Exchange (201) 648-2332

December 14, 1978

David Lipsky, Ph.D.
Office of Cancer and Toxic Substances
N.J. Department of Environmental Protection
Box 1390
Trenton, New Jersey 08625

Dear Dave:

With this letter I am submitting all of the mercury data as required by the Study contract. As you requested in the contract, no written report accompanies this data submission. The data are geographically arrayed to facilitate reference with station locations indicated on maps previously sent during the year. As I indicated in my last letter on December 6, 1978 (final data report) I am still awaiting results of quality assurance analyses being conducted at N.J.D.O.A. and N.J.I.T. laboratories. When I have received them, I'll send you tabulated comparisons.

Sincerely,

Paul Galluzzi

PG/jc

Attachment

823960019

ATIONS OF MERCURY (PPM) IN MARSH SOILS AND CHANNEL SEDIMENTS THROUGHOUT THE
SACK MEADOWLANDS. VALUES OF DEPTH ARE GIVEN IN INCHES.

STATION	MARSH DEPTH	MARSH CONCENTRATION	CHANNEL DEPTH	CHANNEL CONCENTRATION
1 River Upstream	0-2	6.0	0-2	3.7
	2-4	18	2-4	3.7
	4-6	27	4-6	2.8
	6-14	13	6-12	.50
			12-13	.40
2 River Upstream	0-2	2.6	0-2	<.1
	2-4	2.4	2-4	<.1
	4-6	5.3	4-6	<.1
	6-12	.34		
	12-18	<.1		
3 Dike Ditch	0-2	29	0-2	2.8
	2-4	46	2-4	1.6
	4-6	26	4-6	2.0
	6-12	4.2	6-12	5.0
	12-14	6.2		
4 Cove Creek	0-2	<.1	0-2	<.1
	2-4	<.1	2-4	<.1
	4-6	1.2	4-6	.14
	6-12	1.1	6-12	.12
	12-18	<.1	12-14	<.1
5 Doctor's Creek	0-2	10	0-2	<.1
	2-4	4.6	2-4	<.1
	4-6	1.2	4-6	<.1
	6-12	22	6-12	<.1
	12-16	7.4		
6 Bellman's Creek	0-2	1.2	0-2	33
	2-4	2.2	2-4	7.5
	4-6	1.6	4-6	3.4
	6-12	.85	6-12	3.8
			12-18	4.4
7 Bellman's Creek	0-2	8.0	0-2	12
	2-4	39	2-4	7.6
	4-6	48	4-6	4.2
	6-12	11	6-12	10
	12-15	6.7	12-15	2.2

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...TIONS OF MERCURY (PPM) IN MARSH SOILS AND CHANNEL SEDIMENTS THROUGHOUT THE
...ACK MEADOWLANDS. VALUES OF DEPTH ARE GIVEN IN INCHES.

STATION	MARSH DEPTH	MARSH CONCENTRATION	CHANNEL DEPTH	CHANNEL CONCENTRATION
8 Cromakill Creek	0-2	13	0-2	2.8
	2-4	32	2-4	1.7
	4-6	46	4-6	1.1
	6-12	6.2	6-12	<.1
			12-15	.4
9 Cromakill Creek	0-2	40	0-2	9.2
	2-4	54	2-4	10
	4-6	23	4-6	9.0
	6-9	4.4	6-8	<5.0
10 Mill Creek	0-2	11	0-2	<.1
	2-4	14	2-4	<.1
	4-6	26	4-6	<.1
	6-12	38	6-12	<.1
	12-15	7.2	12-15	<.1
11 Moonachie Creek	0-2	.22	0-2	1.1
	2-4	.1	2-4	.68
	4-6	<.1	4-6	.94
	6-12	.1	6-12	.42
			12-17	.14
12 River Upstream	0-2	12	0-2	13
	2-4	31	2-4	16
	4-6	32	4-6	7.1
	6-12	3.1	6-12	7.6
	12-18	.70	12-18	36
[illegible] [illegible] Marsh	0-2	.33	None	None
	2-4	.34	None	None
	4-6	.66	None	None
	6-12	.92	None	None
	12-15	1.2	None	None
[illegible] River Marsh [illegible]	0-2	22	0-2	<.1
	2-4	24	2-4	<.1
	4-6	26	4-6	<.1
	6-12	7.2	6-12	<.1
	12-15	9.8	12-15	<.1

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STATION	MARSH DEPTH	MARSH CONCENTRATION	CHANNEL DEPTH	CHANNEL CONCENTRATION
15	0-2	14	0-2	<.1
River Opposite	2-4	5.8	2-4	<.1
Berrys Canal	4-6	5.0	4-6	<.1
	6-12	15	6-13	<.1
	12-14	8.6		
16	0-2	26	0-2	5.4
Upstream	2-4	4.8	2-4	10
West Riser	4-6	5.9	4-6	3.3
	6-12	6.9	6-12	5.1
	12-18	4.4	12-15	2.2
17	0-2	10	0-2	1.3
Upstream	2-4	14	2-4	1.7
East Riser	4-6	3.8	4-6	1.8
	6-12	1.5	6-12	.36
	12-14	1.6	12-15	.78
18	0-2	422	0-4	276
Berrys Creek	2-4	348	4-8	807
	4-6	442	8-12	1142
	6-12	1697	12-18	1392
	12-13	2006		
19	0-2	280	0-2	218
Peach Island	2-4	364	2-4	37
Creek	4-6	135	4-6	15
	6-12	26	6-12	7.6
	12-15	.90	12-18	11
20	0-2	64	0-2	58
Berrys Creek	2-4	190	2-4	438
Tidal Marsh	4-6	52	4-6	247
	6-12	11	6-12	18
			12-15	4.8
21	0-2	49	0-2	8.6
Berrys Creek	2-4	32	2-4	7.4
Canal	4-6	30	4-6	3.4
	6-12	164	6-12	1.4
	12-18	246	12-17	.76

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...ATIONS OF MERCURY (PPM) IN [illegible]
...SACK MEADOWLANDS. VALUES OF DEPTH ARE GIVEN IN INCHES.

STATION	MARSH		CHANNEL	
	DEPTH	CONCENTRATION	DEPTH	CONCENTRATION
22	0-2	27	0-2	2.5
Berrys Creek	2-4	23	2-4	1.4
Canal	4-6	21	4-6	1.1
	6-11	57	6-12	.72
23	0-2	62	0-2	14
Berrys Creek	2-4	7.6	2-4	6.4
Creek	4-6	28	4-6	3.2
	6-12	28	6-12	4.7
24	0-2	22	0-2	12
Berrys Creek	2-4	28	2-4	5.9
Creek	4-6	9.7	4-6	6.7
	6-11	3.0	6-12	8.9
			12-18	3.9
25	0-2	8.9	0-2	8.4
Kingsland	2-4	2.2	2-4	8.0
Creek	4-6	3.6	4-6	6.8
	6-12	24	6-12	8.8
			12-18	2.2
26	0-2	9.4	0-2	8.6
Anderson Creek	2-4	11	2-4	4.6
	4-6	12	4-6	10
	6-12	12	6-10	25
	12-15	48		
27	0-2	6.1	0-2	6.0
River down-	2-4	8.4	2-4	.64
stream	4-6	.58	4-6	.24
	6-12	.16	6-12	.19
	12-18	9.5	12-16	<.1

#	DEPTH	[illegible] CONCENTRATION
28 Sawmill	0-2	2.5
	2-4	2.0
	4-6	1.4
	6-12	.15
29 Sawmill	0-2	.36
	2-4	.38
	4-6	.18
	6-12	.1
	12-14	<.1
30 Sawmill	0-2	6.7
	2-4	7.3
	4-6	8.4
	6-12	5.8
	12-15	8.0
31 Sawmill	0-2	.30
	2-4	<.1
	4-6	<.1
	6-12	<.1
	12-14	<.1
34 Sawmill	0-2	.41
	2-4	.10
	4-6	<.1
	6-12	.14
	12-15	<.1
35 Sawmill	0-2	7.6
	2-4	6.2
	4-6	5.6
	6-12	11
		10
42 Sawmill	0-2	.42
	2-4	.22
	4-6	.20
	6-12	.13
	12-14	<.1

HACK MEADOWLANDS. VALUES OF DEPTH ARE GIVEN IN INCHES.

STATION	MARSH DEPTH	MARSH CONCENTRATION	CHANNEL DEPTH	CHANNEL CONCENTRATION
32	0-2	8.2	0-2	2.0
Sawmill	2-4	12	2-4	.26
Straight	4-6	28	4-6	.17
Ditch	6-12	24	6-12	<.1
			12-16	<.1
33	0-2	6.6	0-2	.45
Sawmill	2-4	7.0	2-4	<.1
Marsh	4-6	9.2	4-6	<.1
	6-12	10	6-12	<.1
			12-18	<.1

STATION	FRESHWATER MARSH DEPTH	FRESHWATER MARSH CONCENTRATION
36	0-2	2.8
Kearny	2-4	1.6
	4-6	1.2
	6-10	2.0
37	0-2	.70
Kearny	2-4	.37
37A	0-2	.49
Kearny	2-4	.41
38	0-2	.55
Kearny	2-4	.31
	4-6	.19
	6-12	.30

...TRATIONS OF MERCURY (PPM) IN MARSH SOILS AND CHANNEL SEDIMENTS THROUGHOUT THE ...ENSACK MEADOWLANDS. VALUES OF DEPTH ARE GIVEN IN INCHES.

STATION	MARSH DEPTH	MARSH CONCENTRATION	CHANNEL DEPTH	CHANNEL CONCENTRATION
39 Windy Ditch Marsh	0-2	6.2	0-2	.20
	2-4	5.2	2-4	<.1
	4-6	2.6	4-6	<.1
	6-12	.90	6-12	<.1
	12-15	.14	12-14	<.1
40 Penhorn Creek	0-2	64	0-2	97
	2-4	158	2-4	84
	4-6	150	4-6	66
	6-12	14	6-9	68
41 Penhorn Creek	0-2	3.0	0-2	5.0
	2-4	14	2-4	28
	4-6	20	4-6	13
	6-12	82	6-12	11
	12-14	15	12-14	9.4

Carlstadt Garden soil 1.4

823960026

STUDY SEDIMENT STATIONS

Berrys Creek Channel

Station	Depth 0 - 4	Depth 4 - 8
1	36	<.1
2	39	2.4
3	34	18
4	103	44
5	96	14
6	18	32
7	62	77
8	4.7	3.4
9	3.8	.539
10	54	200
11	<.1	<.1
12	102	232
13	255	510
14	305	424
15	8.2	8.4
16	380	190
17	224	1402
18	59	66
19	272	846
20	455	621
21	1708	1350
22	198	1154
23	318	971
24	748	718
25	[illegible]	68

Carlstadt (Eight Day Swamp) Tidal Marsh

Station No.	Depth (inches)	Concentrations
1A	0-2	493
	2-4	183
	4-6	719
	6-12	255
	12-15	4.4
1B	0-2	320
	2-4	1496
	4-6	332
	6-10	118
2	0-2	1747
	2-4	1713
	4-6	342
	6-8	13.0
3A	0-2	133
	2-4	22
	4-6	2.4
	6-8	5.9
3B	0-2	105.9
	2-4	578
	4-6	47
	6-12	4.9
4	0-2	1455
	2-4	1615
	4-6	301
	6-12	142
	12-14	2.7
5	0-2	196
	2-4	63
	4-6	0.8
	6-12	0.6
	12-13	0.7

823960028

VEGETATION STATION		SPECIES	RHIZOME	STEM	LEAF	FRUIT STRUCTURE
f Berrys Creek Canal						
ack Rv.	1	Phragmites	.259	.165	.388	.237
		S. Alt.	.508	.274	.596	--
's	2	Phragmites	.144	.084	.227	.350
	3	Hemp	.346	.239	.640	.827
	3	Soft Stem Bullrush	.105	.268		1.0
	3	Spartina Alt.	.307	.055	.308	.705
	3	Phragmites	.098	.119	.398	
	3	Typha	.092	.219	.293	.107
	4	Phragmites	.192	.044	.381	.150
		S. Alt.	.553	.124	.371	0
c-	5	Phragmites	.113	.326	.082	.398
1 Cr.	7	Phragmites	.504	.098	.434	.529
		Atriplex	.528	.769	2.2	.434
		Acnida	.532	.085	.770	.475
Cr.	8	Phragmites	.076	.108	.398	.516
	8	Spartina Alt.	.636	.149	.340	.263
e.	9	Phragmites	.246	.113	.508	.250
		Atriplex	.191	.069	.692	.195
		Typha	.588	.016	.317	--
	10	Phragmites	.164	.165	.240	--
		Typha	.104	.082	.216	--
		Potamogeton(Pondweed)	--	.225		--
		Bullrush	.344	.143	--	.160
	11	Phragmites	.186	.122	.471	.636

823960029

VEGETATION STATION	SPECIES	RHIZOME	STEM	LEAF	FRUIT STRUCTURE	
:k Rv. 12	Phragmites	.305	.071	.500	.966	
reek 13	Phragmites	5.4	.186	.859	.763	
	Acnida	4.3	--	2.9	1.2	
	Typha	5.2	.540	.591	.360	
14	Typha	7.9	1.8	.341		
14	Phragmites	3.5	.114	1.2	.824	
14	Spikerush					13.5
15	Phragmites	3.5	.540	.968	3.2	
reek 16	Spartina Cyanosuroides	.486	.165	.652	.164	
16	Typha	1.1	.137	1.0	.116	
16	Hemp	1.6	.116	1.1	2.0	
16	Phragmites	1.3	.168	.525	.622	
16	Spartina Alt.	2.3	.114	.786	.590	
16	Atriplex	3.6	.141	2.6	2.6	
17	Phragmites	.827	.279	.599	.733	
17	Typha		0	.715	0	
17	Spartina Alt.		.122	1.7		
17	Hemp	3.0	.825			
18	Spartina Cyanosuroides	1.2	.236	.712	.289	
18	Spartina Alt.	5.6	.212	.787	.300	
18	Phragmites	.848	.078	.416	.153	

823960030

VEGETATION STATION	SPECIES	RHIZOME	STEM	LEAF	FRUIT STRUCTURE
18	Typha	.140	.154	.488	
19	Phragmites	.273	0	.237	.207
19	Spartina Alt.	.211	0	.434	.400
20	Phragmites	.262	0	.148	.237
20	Spartina·Alt.	.386	0	.144	.504
21	Phragmites	.076	.150	.445	.372
	S. Alt.	.033	.195	0	--
22	Phragmites	.193	.132	.481	.338
	S. Alt.	.277	.142	.322	.373
	Atriplex	.280	.358	1.9	.704
23	Phragmites	.071	.051	.408	.808
23	Phragmites	.058	.496	.112	.736
24	Phragmites	.008	0	.810	.668
24	Spartina Alt.	.040	.044	1.4	
[illegible] Mars-25	Distichlis		.607	.672	1.3
25	S. Patens		.268	1.2	
25	Phragmites	0	0	1.7	.693
25	Spartina Alt.	0	0	.078	.268
[illegible]on Cr. 26	Phragmites	.315	.176	--	.341
[illegible] 27	Phragmites	--	.057	--	.644
	S. Alt.	--	.461	.351	--
28	Phragmites	--	.061	.664	--
	S. Alt.	--	.092	1.296	--

	VEGETATION STATION	SPECIES	RHIZOME	STEM	LEAF	FRUIT STRUCTURE
11 Cr. image	29	Cress	0	0	.206	
	29	Marsh Mallow		0		0
	29	Phragmites	.037	0	.315	.550
	29	Ragwort	0	0	.836	.415
	30	Ragweed		.096		
	30	Spartina Alt.	.267	.121	.488	1.3
	30	Aster	1.0	.201		4.9
	30	Hemp	.637	.361		
	31	Phragmites S. Alt.	.067 .118	.045 .072	.536 .209	.356 --
	32	Phragmites S. Alt.	.424 .136	.113 .204	.478 .033	1.0 --
	33	Phragmites S. Alt.	.419 1.6	.104 .073	.580 --	.586 --
	34	Phragmites S. Alt.	.508 .244	.020 .079	.245 .200	.804 --
	35	Phragmites S. Alt.	.186 .192	.211 .133	.447 .297	.948 --
	35	Spartina Alt.	.078	.090	.382	
	35	Phragmites	.151	.141	.374	.365
water ..es	36	Lemna		W H O L E		.088
	36	Phragmites	.103	.079	.370	.056
	37	Phragmites	.187	.105	.590	1.1

823960032

EGETATION STATION		SPECIES	RHIZOME	STEM	LEAF	FRUIT STRUCTURE
	38	Phragmites	0	0	0	.452
ch	39	Phragmites	.105	.093	.525	--
		S. patens/	.254	.279	.506	--
		Distichlis	.445	.160	.664	.673
		Pluchea	.913	.170	.626	.261
	40	Phragmites	.448	--	.535	.240
		S. Alt.	.493	.321	.370	.198

[illegible] River	Phragmites communis	.127	.043	
	Scirpus Validus			
	(Soft Stem Bulrush)	.169	.079	
	Spartina alterniflora	.265	.052	
[illegible]'s Creek	P. communis	.059	.032	
[illegible]	P. communis	.113	.091	
	S. validus	.063	.073	
	Typha sp.(cattail)	.110	.087	
	S. alterniflora	.065	.031	
[illegible]	P. communis	.103	.065	
	S. alterniflora	.325	.078	
5 Dike Ditch	P. communis	.144	.146	
6 Doctor's Creek	P. communis	.116	.085	
	S. alterniflora	.119	.057	
7 Cromakill Creek	P. communis	.123	.061	
8 Washout Creek	Phragmites	.216	.163	
	Spartina Alt.	.357	.172	
9 Mill Creek	Distichlis spicata(spike grass)	.130	.295	
	Atriplex sp.	.133	.146	
	P. communis	.174	.084	
	Typha Sp.	.113	.074	
	S. validus	--	.178	, Fruit, .087
11 Hackensack River	P. communis	.085	.046	
12 Hackensack River	Phragmites	0	0	
13 Berrys Creek	P. communis	.280	.078	
	Typha sp.	.116	.265	
14	Typha sp.	.422	.259	
	P. communis	.240	.075	
15	P. communis	.110	.040	
16 Berrys Creek Drainage	Spartina cynosuroides	.178	.120	
	P. communis	.175	.100	
	Typha sp.	.229	.039	
17	P. communis	.164	.048	
	S. alterniflora	.629	.033	
	Acnida cannabinus (water hemp)	1.8	.565	
[illegible]	S. cynosuroides	.097	.048	
	Atriplex sp.	.179	.163	
	Typha sp.	.033	.059	
	P. communis	.103	.012	

823960034

	S. alterniflora	[illegible]	.083	
	P. communis	.132	.059	
	S. alterniflora	.154	.101	
	P. communis	.103	.038	
21	P. communis	.140	.050	
	S. alterniflora	.214	.090	
22	P. communis	.050	.036	
	S. alterniflora	.229	.124	
	A. cannabinus	.242	.138	
23	P. communis	.124	.051	
24	P. communis	.208	.108	
	S. alterniflora	.215	.168	
25 Hackensack River Marsh	Green Algae			.468
	S. Patens	.558	.203	
	Phragmites	.131	.155	
27 Kingsland	S. alterniflora	.426	.163	
	P. communis	.167	.126	
28 Riverbank	S. alterniflora	.280	.052	
	P. communis	.159	.106	
	Phragmites	.089	0	
29 Sawmill Creek Drainage	P. communis	.150	.045	
30	S. alterniflora	.203	.082	
	P. communis	.203	.183	
	A. cannabinus	.159	.072	
	Dodder	Whole		.125
31	Spartina Alt.	1.3	.040	
	Phragmites	.116	0	
32	Spartina Alt.	.510	.165	
	Phragmites	0	0	
33	Phragmites	.150	0	
34	Spartina Alt.	.405	0	
	Phragmites	.003	0	
35	S. alterniflora	.200	.031	
36 Freshwater Marshes	Lemna sp. (duckweed)	Whole		.391
	P. communis	.135	.070	
37	P. communis	.078	.032	

823960035

	SPECIES	LEAF	STEM	
...ch	Juncus girardi(black rush)	.550	.113	
	Atriplex sp.	.223	.126	
	P. communis	.145	.095	
	D. spicata	.231	.127	
	P. communis	.152	.085	
	S. alterniflora	.261	.116	
...ill Straight Ditch	Green Algae			1.005
...s Creek Canal	Green Algae			1.9
...antic City Salt Marsh	P. communis	.131	.041	
	S. alterniflora	.120	.076	
	S. Patens	.105	.095	
	Salicornia sp.	Whole		0
	Bayberry	.186	.104	
Carlstadt Garden Soil	Lettuce	.425	--	
	Raddish	.396	--	Root, .210
...lisades Park	Ripe Tomato	--	--	0
	Unripened Tomato	--	--	0
P&M Landfill	Zuchini	--	--	.023
...SLA Landfill	Unripened Tomato	--	--	0
	Ripe Tomato	--	--	0

823960036

CONCENTRATIONS OF MERCURY (PPM) IN TISSUE SAMPLES OF FISH
COLLECTED AT STATIONS THROUGHOUT THE HACKENSACK MEADOWLANDS

	# SPECIMENS IN SAMPLE	SPECIES	MUSCLE	LIVER	KIDNEY
S.E.AG. Bergen Station-Ridgefield	1	Alewife	.071	.058	.139
		Bluegill Sunfish	.122	.203	
		White Perch	.275	.249	.054
		American Eel	.264	.116	
		Pumpkinseed	.231	.198	.212
Berlman's Creek	5	Killifish	.078		
			.035		
			.093		
			.075		
			.062		
Romakill Creek	5	Killifish	.110		
			.125		
			.095		
			.100		
			.055		
			.175		
			.121		
			.105		
Cashout Creek (Transco Marsh)	1	Killifish	.088		
			.209		
			.160		
			.150		
			.127		
			.125		
			.216		
			.045		
			.148		
			.181		
			.034		
			.095		
			.064		
			.044		
			.025		
			.107		
			.098		
			.105		
			.057		
			.112		

823960037

COLLECTED AT STATIONS THROUGHOUT THE HACKENSACK MEADOWLANDS

	# SPECIMENS IN SAMPLE	SPECIES	MUSCLE	LIVER	KIDNEY
onachie Creek	5	Killifish Tail	.048		
			.055		
		Killifish	.129		
			.129		
		Sunfish	.051		
			.031		
		Sunfish Tail	.051		
			.085		
			VOID		
onachie Creek Mouth	1	Carp	.430	.274	.083
			.528	.440	.091
			.209	1.2	.153
			.125	.407	.085
			.188	.110	.039
			.238	.214	.011
est Riser Ditch (Pumphouse Road)	1	Killifish	.183		
			.084		
			.064		
			.071		
			.031		
			.112		
			.059		
			.070		
			.042		
			.030		
est Riser Ditch ide Gate	5	Killifish	.227		
			.182		
			.077		
			.246		
			.678		
			.312		
			.193		
			.175		
			.155		
			.210		
errys Creek unction at ast Riser	5	Killifish	.183		
			.137		
			.119		
			.197		
			.167		
			.121		
			.188		
			.093		
			.376		
			.113		

[illegible]

	# SPECIMENS IN SAMPLE	SPECIES	MUSCLE	LIVER	KIDNEY
Creek at Marsh	5	Killifish	.225		
			.252		
			.250		
			.141		
			.177		
			.174		
			.224		
			.135		
			.135		
			.060		
T. iboro Treatment Discharge to Berrys Creek	5	Killifish	.411		
			.237		
			.150		
			.208		
Service Rd. Ditch at Rt. 3 & Berrys Creek	4	Killifish	.239		
			.261		
Berrys Creek Creek South of Service Rd.	1	American Eel	.540	3.8	.441
		Killifish	.293		
			.019		
			.227		
			.000		
			.282		
			.234		
			.354		
			.234		
			.441		
Berrys Creek Canal	1	White Perch	.450	.490	.300
			1.9	.919	.005
			.690		
			.302		
			.768	.540	.013
			.302		
			.343		
			.401		
		Killifish	.269		
			.169		
			.272		
			.138		
			.146		
			.127		
			.444		
			.233		
			.140		
			.070		
			.230		
			.264		
			.313		
			.150		

CONCENTRATIONS OF MERCURY (ppm) ...
COLLECTED AT STATIONS THROUGHOUT THE HACKENSACK MEADOWLANDS

	# SPECIMENS IN SAMPLE	SPECIES	MUSCLE	LIVER	KIDNEY	EGGS
...ck River at ...rrys Creek Canal	1	Killifish	.354			
			.272			.364
...ish Creek North of Railroad	5	Killifish	.125			
			.173			
			.119			
			.137			
...ish Creek at Railroad	5	Killifish	.093			
...errys Creek Creek at Transco Bridge	1	Killifish	.293			
			.209			
			.268			
			.198			
			.346			
			.235			
			.268			
			.241			
			.735			
			.724			
...errys Creek at Hackensack River	2	Killifish	.011			
			.019			
...awmill Creek just east of turnpike	1	White Perch	.950	1.3	.386	
			(.430)(.570)	.798	.023	
			.950	(1.4)		
				(1.4)	.349	
		Carp	.310	VOID	.113	
			(.276)(.262)	.141	.440	
	2	Killifish	.132			
	1		.234			
			.257			
			.441			
			.542			
			.364			
			.393			
			.280			
			.254			
			.137			
			.444			
			.282			
...wmill Creek South	1	Killifish	.605			
			.066			
			[illegible]			
			.261			
			.338			
			[illegible]			
			.201			
			[illegible]			

CONCENTRATIONS OF MERCURY (PPM) IN TISSUE SAMPLES OF FISH
COLLECTED AT STATIONS THROUGHOUT THE HACKENSACK MEADOWLANDS

	# SPECIMENS IN SAMPLE	SPECIES	MUSCLE	LIVER	KIDNEY	GILL
...mill Creek Mouth	1	Carp	.052			.080
...ndy Pitch	1	Killifish	.463			
			.468			
			.433			
			.691			
			.758			
			.320			
			(.869)(.551)			
	5		.398			
			.341			
			.307			
			.320			
PSE&G Hudson Station-Jersey City	1	Bluefish	(.475)(.964)	1.1	3.0	
		Alewife	.568			
			.748			
			.470			
			.705			
			.896			
		Blueback Herring	1.4			
			1.3			
			1.1			
			1.7			
			.781			
		Bay Anchovy	.708			
		Atlantic Silversides	.572			
		American Shad	1.6			
		Striped Sea Robin	.157	.120	.000	
		Weak Fish	(.289)(.964)	1.1	3.0	
			.441	2.1	3.2	
			1.0	1.6	.000	
			.811	1.9	2.3	
			.497	1.7	2.0	

823960041

...S OF MERCURY (PPM) IN TISSUES OF MARSH BIRDS AND WATERFOWL COLLECTED IN THE HACKENSACK MEADOWLANDS DURING 1978

	SPECIES	FEATHER	MUSCLE	LIVER	KIDNEY	FA
...th of Bellman's ...ek	Gallinule	1.5	.059	.559	.616	
...llman's Creek	Great Blue Heron	2.4	.408	.426	.729	
...sen Slote Creek	Green Heron (imm)	4.3	.368	.830	.485	
...shout Creek	Great Blue Heron	6.1	1.2	4.0	1.5	
	Gallinule	3.8	.417	1.4	2.6	
...rmer Ventron-site	Woodcock	.124	.263	.426	.819	
...errys Creek Tidal ...arsh	Gallinule	4.4	.189	1.2	2.6	
...errys Creek	Green Heron	.460	.852	3.1	2.9	
...errys Creek Canal	Gallinule	5.8	.593	1.9	4.4	
...ish Creek near ...ailroad Track	Pheasant	.438	.009	.059	.053	
...urnpike Exit 16W	Barn Owl	--	.064	.075	.097	
...y Ann Creek	Gallinule	5.5	.471	2.3	2.1	
...awmill Creek	Gallinule	6.2	.557	.939	1.6	
	Green Heron	9.0	.825	1.8	1.5	
	Snowy Egret	1.6	.399	1.0	.736	
	Coot	2.9	.521	--	.530	.13
	Black Crowned Night Heron	4.2	.098	1.3	1.8	.51
	Herring Gull	1.9	.674	.896	1.3	
	Laughing Gull	6.1	.239	.974	.974	
	Laughing Gull	3.5	.167	1.1	.593	
	Green Wing Teal	3.2	.070	.040	.088	
	Black Duck	2.0	.224	1.4	1.4	.09
	Lesser Scaup	4.1	.501	2.0	1.7	
	Mallard	.809	.182	.628	.639	
	Mallard	.894	.095	.635	.682	
	Mallard	2.5	.716	1.2	1.1	
	Mallard	7.5	.458	1.2	.620	
	Dowitcher	1.2	.238	.362	.389	

823960042

...ONS OF MERCURY (PPM) IN TISSUES OF MARSH BIRDS AND WATERFOWL COLLECTED IN THE HACKENSACK MEADOWLANDS, SPRING 1978

SITE	SPECIES	FEATHER	MUSCLE	LIVER	KIDNEY
...ody Ditch	Gallinule	6.1	.298	1.1	1.4
	Blue Wing Teal	1.9	.369	1.7	1.0
	Mallard	2.3	.462	1.1	1.5
...elleville Turnpike ...adio Station	Coot	.310	.011	.194	.022
...lleville Pike ...SE&G	Herring Gull	1.8	.316	1.8	.027
...earny Freshwater ...arsh	Gallinule	1.6	.105	.210	.277
	Gallinule	--	.127	.446	--

823960043

... OF MERCURY (PPM) IN TISSUES OF MAMMALS COLLECTED IN THE HACKENSACK MEADOWLANDS DURING 1978

[illegible]	SPECIES	FUR	MUSCLE	LIVER	KIDNEY	BLOOD	FAT
[illegible]	[illegible]		.112	.591	1.7		
[illegible]				.025	[illegible]		
						.010	0
				.197	.263	--	.010
	[illegible]	[illegible]	[illegible]	.095	.022		
		[illegible]	.013				
...ction of Berrys ...eek Canal and ...eek, north of ...ilroad tracks	House Mouse	.726	.045	.101	.092		
	House Mouse	.428	0	0	.926		
	House Mouse	.344	0	.113	0		
...ute 3 South ...ervice Road	Vole	.227	0	0	.250		
	Vole	.316	0	0	.128		
	Rabbit	.085	0	.112	.522		
...ea south of Rt. 3 .... Service Rd. exit	Rabbit	.045	0	.181	.730		
	Vole	.056	0	0	.310		
	Vole	.041	0	0	.134		
...rrys Creek ...nter Tract	House Mouse	1.4	0	.013	.210		
		.891	0	.098	.635		
		2.3	.029	.208	.519		
		.239	0	0	.888		
		0	0	0	.121		
...th of Berrys ...eek Canal, east of Franco Road, ...st of Tnpk.	House Mouse	.657	0	.080	.379		
		0	0	0	0		
	Norway Rat	4.0	.045	.134	1.9		
	Opossum	1.9	.195	.224	1.9		
...rgen County ...andfill	Norway Rat	.365	0	.022	.125		
...sco Road ...ngsland Creek	Rabbit	.075	0	.147	.271		
...awmill Creek	Muskrat	--	.005	.067	.006		
		--	.005	.059	.020		
...erny Freshwater ...rsh	Muskrat	--	.013	.009	.042		

823960044

...LS OF MERCURY (PPM) IN TISSUES OF MAMMALS COLLECTED IN THE HACKENSACK MEADOWLANDS DURING 1978

...ATION	SPECIES	FUR	MUSCLE	LIVER	KIDNEY	FAT
...EGG ROAD	Norway Rat	.393	0	.013	.477	
...arny	Vole	.250	0	0	.097	.002
	Vole (imm)	--	WHOLE 0	0	.206	
	Vole					
...enhorn Creek	Norway Rat	3.4	.141	.250	2.4	

OUTSIDE OF MEADOWLANDS DISTRICT

...ute 208 ...irlawn	Raccoon	--	.064	.248	.227	.012
...ssex County	Beaver	--	.026	.015	.061	.038
	Muskrat	--	.012	.006	.047	
...onmouth County	Muskrat	--	--	.010	.038	

823960045

OF MERCURY (PPM) IN AQUATIC INVERTEBRATES COLLECTED AT STATIONS WITHIN THE HACKENSACK MEADOWLANDS

	SPECIES	MUSCLE	VISCERA	CARAPACE	WHOLE
...sh north of ...te 3 between ...asco Road and ...ver	Fiddler Crab	.079	.148	.000	
		.117	.356	.000	
...rys Creek Canal	Fiddler Crab	.448	.532	.186	
		.145	.861	.156	
		.416	.955	.189	
		.473	2.7	.366	
		.162	1.8	.104	
...rrys Creek ...reek south of ...rvice Road	Grass Shrimp				.052
					.427
					.370
					.000
					.106
					.517
...rrys Creek ...anal at ...ckensack ...ver	(2) Grass Shrimp				.119
	(3) Grass Shrimp				.117
	Grass Shrimp				.037
					.000
					.076
...t side of ...er, south of ...ys Creek ...eek(Patens ...a)	Fiddler Crab	.119	.393	--	
		--	.537	--	
		.321	.470	.036	
		.216	.550	.036	
		.118	1.2	.075	
		.217	.604	.047	
		.058	.507	.028	
...amill Creek ...ast of Tnpk.	Blue Claw Crab	.761	.371	.032	
		.107			
		.187			
		.160			
		.158			
		.202			
		.150			
		.138			
	Mud Crab				.321

823960046

...S OF MERCURY (PPM) IN AQUATIC INVERTEBRATES COLLECTED AT STATIONS WITHIN THE [illegible]

AREA	SPECIES	MUSCLE	VISCERA	CARAPACE	WHOLE
Sawmill Creek West of Tnpk.	(3) Grass Shrimp				.195
	(2) Grass Shrimp				.120
	Grass Shrimp				.352
					.275
					.219
					.348
					.213
					.224
					.253
					.350
					.181
					.237
					.166
					.273
					.184
					.341
					.274
					.314
					.179
					.223
					.216
					.280
					.354
					.221
					.258
					.157
					.164
					.413
					.268
					.251
					.335
					.336
					.357
					.184
					.153
					.168
					.152
Sawmill Creek Marsh	Clam				.697
Sawmill Creek Midway between Tnpk. and Hackensack River	Fiddler Crab	.112	.210	.021	
		.181	.408	.001	
		.278	.593	.000	
		.286	.435	.000	
		.253	.053	.000	
		.165	.396	.001	
		.532	.556	.000	
		.090	.093	.005	

...LS OF MERCURY (PPM) IN AQUATIC INVERTEBRATES COLLECTED AT STATIONS WITHIN THE HACKENSACK MEADOWLANDS

...TION	SPECIES	MUSCLE	VISCERA	CARAPACE	WHOLE
...wmill Creek ... mouth	Fiddler Crab	.264	.165	.040	
		.334	.161	.000	
		.177	.116	.000	
		.258	.360	.001	
		.312	.220	.014	
		.288	.187	.019	
		.261	.258	.000	
...ckensack River ...posite Sawmill ...reek	Blue Claw Crab	.287	.255	.000	
		.378	.406	.005	

823960048

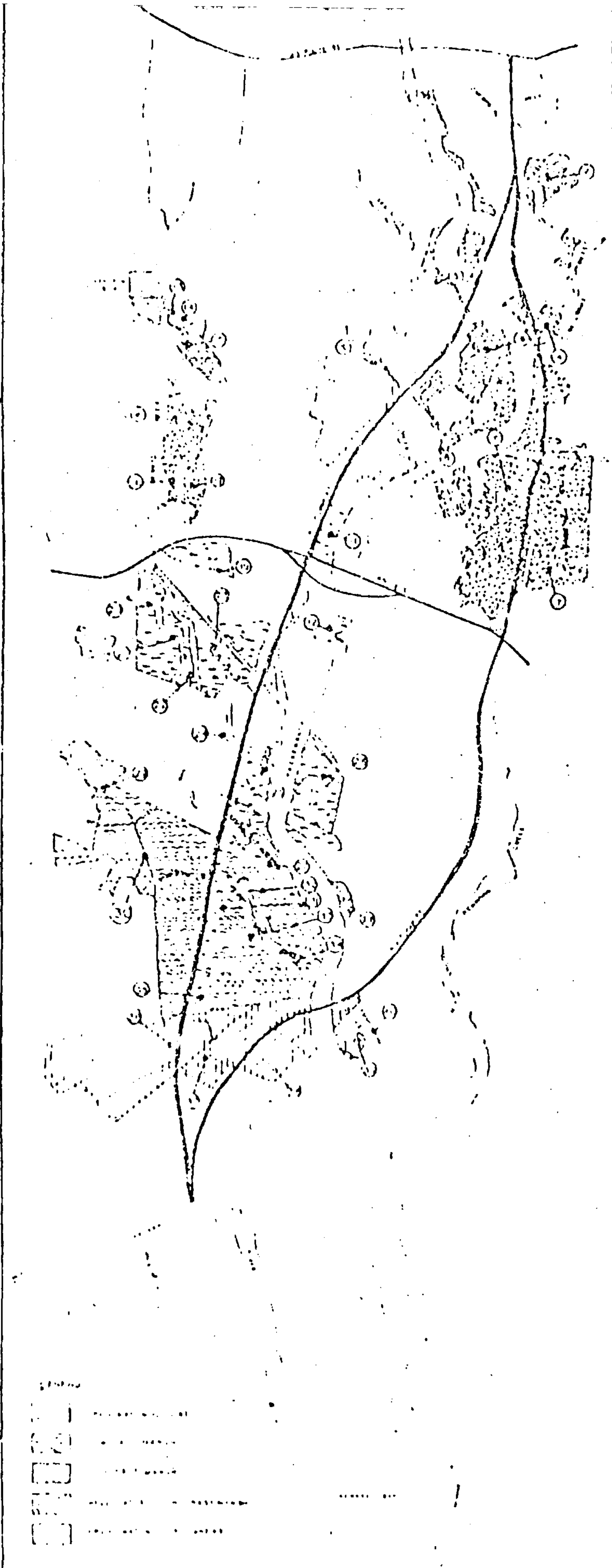
CONCENTRATIONS OF MERCURY(PPM) IN TISSUES OF TERRESTRIAL INVERTEBRATES AND REPTILES COLLECTED IN THE HACKENSACK MEADOWLANDS

STATION	SPECIES	MUSCLE	LIVER	KIDNEY	SKIN	EGG	EGGSHELL	WHOLE	BLOOD
Berrys Creek Center	Cockroach							.075	
	Slug							.144	
ECSA Rd. Little Ferry	Garter Snake	.093	.247	.000	.000				
Losen Slote Creek	Milk Snake	.012	.044	.027	.020				
Sawmill Canal Ditch	Diamond Back Terrapin	.396	7.6	2.4	.261	.045			
[illegible] Creek	Diamond Back Terrapin	.524	3.6	1.1	.139		.04[illegible]		[illegible]
Penhorn Creek	Garter Snake	.118	.730	.848	.100				
Ward Ditch	Garter Snake	.637	3.2	.114	[illegible]				

823960049

[illegible] OF THE HACKENSACK MEADOWLANDS FROM NOVEMBER 19[illegible] THROUGH [illegible]

[illegible]	1		2		3		4		5		6		7		8		[illegible]	
	[illegible]	[illegible]	H	L	[illegible]	L	H	L	H	L	H	L	H	L	H	L	H	[illegible]
	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	.41	.94	2.3	.97	3.2	.31	.74	.28
[illegible]red	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	.22	<.1	<.1
	[illegible]	.23	<.1	[illegible]	.13	<.1	.11	.19	.14	.19	.81	.81	.36	1.0	.92	1.4	.33	.50
	[illegible]	[illegible]	.22	.59	.44	.30	.30	<.1	.33	.35	.27	.68	.44	.30	1.1	.54	.47	.37
	<.1	<.1	<.1	<.1	<.1	.19	<.1	.14	.14	.11	.46	1.7	2.1	<.1	1.0	.30	.42	.30
	[illegible]	4.2	.40	.30	1.3	24	.40	.7	1.2	3.2	3.2	9.7	5.9	9.9	13	8.7	3.0	7.7
[illegible]red	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	.2	<.1	<.1	<.1
	[illegible]	.44	.30	.30	.21	.33	.24	.24	.27	.67	.76	2.1	1.4	1.3	.21	6.2	1.6	2.4
	.14	.57	.54	.37	.14	.47	.14	.24	.20	.57	.40	2.6	1.2	1.3	.87	.70	.11	.93
[illegible]red	.10	.17	.10	.10	.14	.17	.10	.10	.10	.14	.14	.20	.27	.14	.20	.20	.27	.18
	.33	.22	.19	.12	.19	.12	.12	.22	.16	.22	.19	1.3	.82	.89	.39	1.3	.31	.55
	.20	<.1	.22	<.1	.17	<.1	.20	<.1	.14	<.1	.36	9.6	.72	.85	.95	.49	.37	1.4
[illegible]red	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	4.0	.1	<.1	<.1	<.1	<.1	.51
	.16	.16	.18	.16	.10	.18	.24	.13	.10	.18	.61	4.6	.40	.50	.61	.84	.30	.85
	<.1	.16	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	.92	.61	1.2	.89	1.2	.19	.44
[illegible]red	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1



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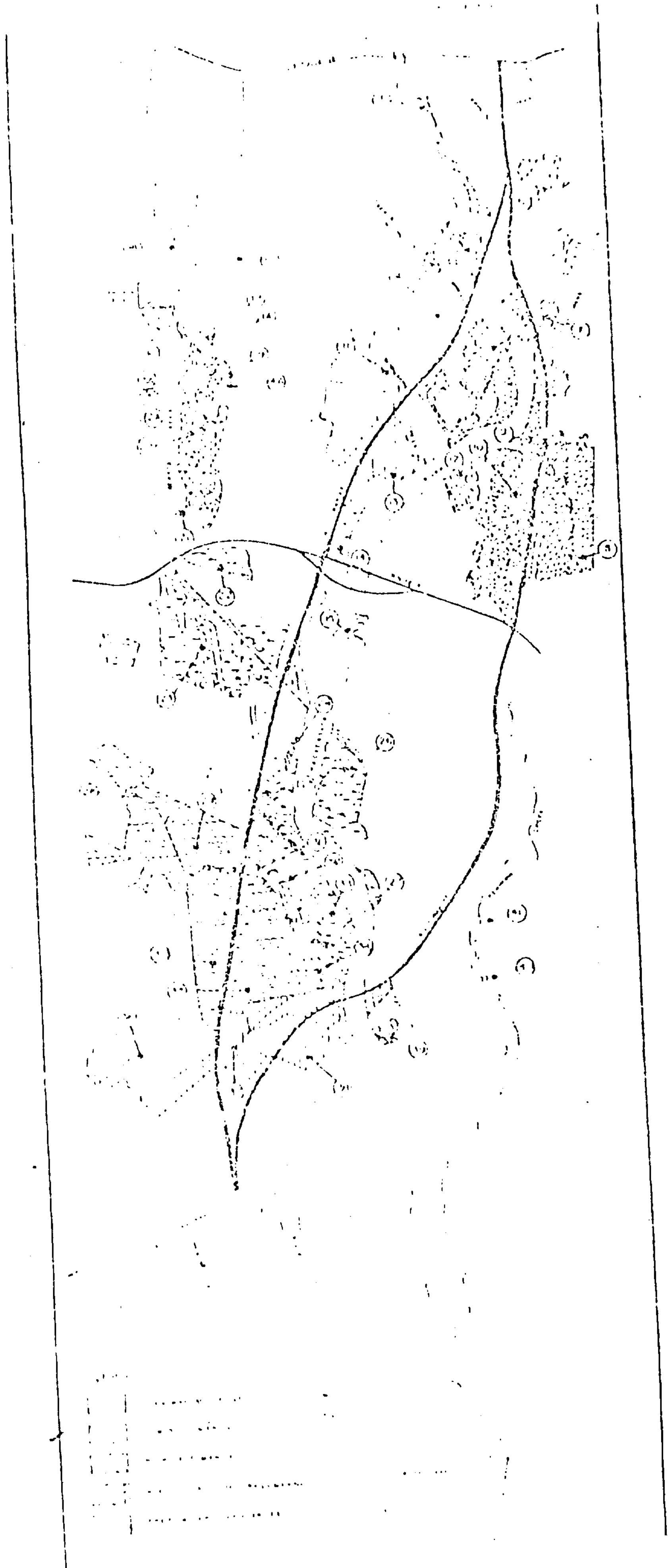

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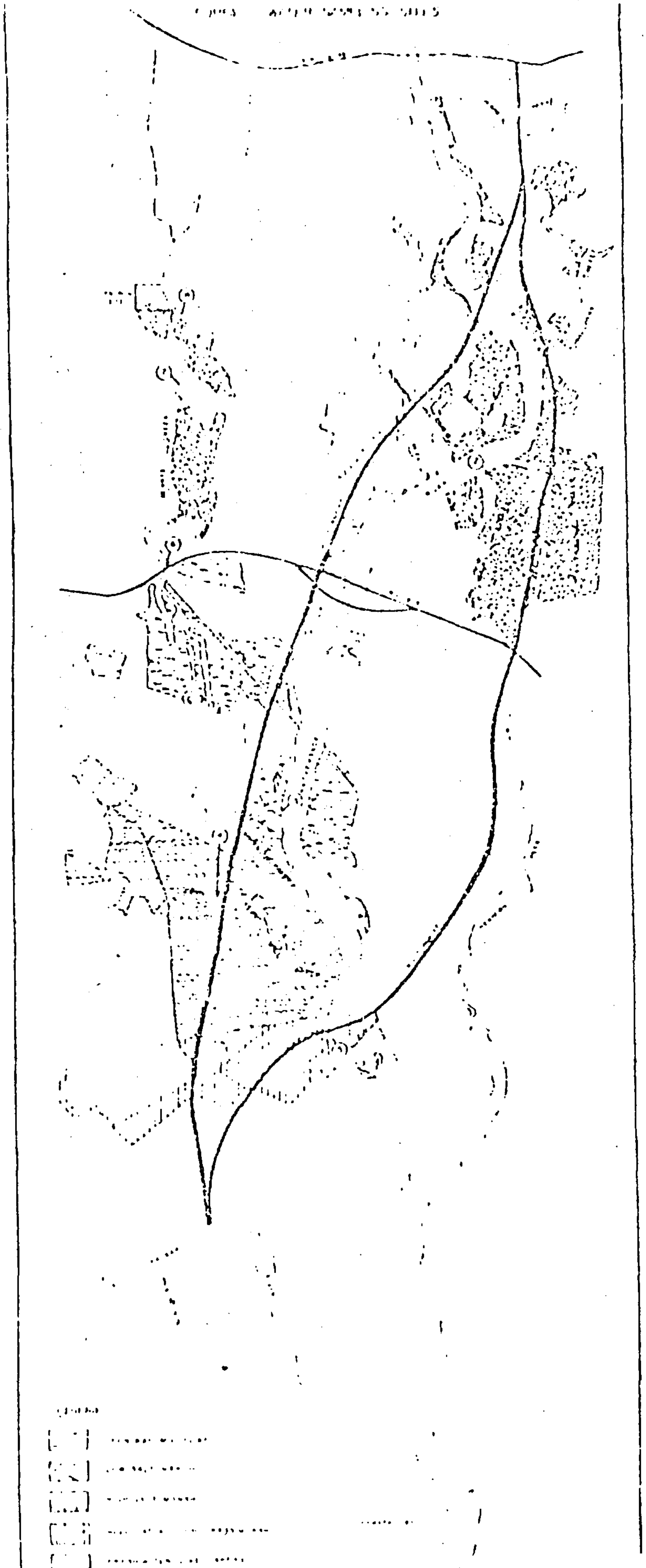

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